

Factor: $3x^2 + 7x + 2 = (3x+1)(x+2)$

Mar 25-8:02 AM

3.8(4.4) Factoring Complex Trinomials ($ax^2 + bx + c$, $a \neq 1$)

Expand $(x + 4)(2x + 3)$. What are the x-terms?

$$(x + 4)(2x + 3) = 2x^2 + 3x + 8x + 12$$

$$= 2x^2 + 11x + 12$$

To factor $2x^2 + 11x + 12$, we need to do these steps in reverse order.

How do the numbers 3 and 8 relate to 2, 11, and 12?

$$3 + 8 = 11$$

$$3 \times 8 = 2 \times 12 = 24$$

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Once you have broken the middle term, you can factor by grouping

$$= 2x^2 + 11x + 12$$

$$\frac{M}{24} \quad \frac{A}{11} \quad \frac{N}{8 \quad 3}$$

$$= 2x^2 + 3x + 8x + 12$$

$$= x(2x+3) + 4(2x+3)$$

$$= (x+4)(2x+3)$$

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Ex. Factor $6m^2 + 13m - 5$

Numbers multiply to: -30 (product)

Numbers add to: 13 (sum)

Numbers are:

-2 and 15 (integers)

$$= 6m^2 - 2m + 15m - 5$$

This technique is called SPI
(sum, product, integers)

$$= 2m(3m-1) + 5(3m-1)$$

$$= (2m+5)(3m-1)$$

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Ex. Factor $6m^2 + 13m - 5$

Numbers are: **-2** and **15**

Now factor by grouping:

$$6m^2 + 13m - 5 =$$

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Ex. Factor: $6x^2 - 13x + 6$

$$\begin{array}{l}
 \text{M} \quad \text{A} \quad \text{N} \\
 \underline{36} \quad \underline{-13} \quad \underline{\quad} \\
 = 6x^2 - 9x - 4x + 6 \\
 = 3x(2x-3) - 2(2x-3) \\
 = (3x-2)(2x-3)
 \end{array}$$

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Ex. Factor: $10x^2 - 11x - 6$

$$\begin{array}{ccc} \underline{M} & \underline{A} & \underline{N} \\ -6 & -11 & -15+4 \end{array}$$

$$= 10x^2 - 15x + 4x - 6$$

$$= 5x(2x-3) + 2(2x-3)$$

$$= (5x+2)(2x-3)$$

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Ex. Factor: $4x^2 - 5xy - 6y^2$

$$\begin{array}{ccc} \underline{M} & \underline{A} & \underline{N} \\ -24 & -5 & -8, 3 \end{array}$$

$$= 4x^2 - 8xy + 3xy - 6y^2$$

$$= 4x(x-2y) + 3y(x-2y)$$

$$= (4x+3y)(x-2y)$$

Assigned Work:

p.223-224 #3bc, 5abc, 6,

#7abc, 11, 15, 17(Challenging)

Look for common factors first!!!

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